

REMARKS

Status of the Drawings

Applicants note that, in the Office Action Summary dated May 4, 2004, the box is checked to indicate that the drawings filed with the application on December 22, 2000 have been objected to by the Examiner. No further statement is made in the Office Action, however, to explain why the drawings have been objected to, and Applicants also have not received a Notice of Draftsperson's Patent Drawing Review. Therefore, Applicants are unable to respond to the Examiner's objection without further information.

Accordingly, Applicants respectfully request that the objection to the drawings be held in abeyance until allowance of the pending claims, or at least until such time as the Examiner states with more particularity the objection to the drawings submitted.

Status of the Claims

Upon entry of the foregoing amendments, claims 1 through 36 will be pending in the instant application. In an Office Action dated May 4, 2004, claims 1 through 6 were rejected, and claims 7 through 34 were objected to.

Claims 3, 4, 6, 7, 9, 11, 13, 15, 17-20, 22-24, 29, and 31 have been amended to eliminate multiple dependence. Claim 21 has been amended to place the claim in Markush form. Claims 26 through 34 have been amended to place the claims into the format of method claims. Claims 35 and 36 have been added to place matter previously included in claim 28 into separate dependent claims. No new matter has been added.

In view of the foregoing amendments and the arguments that follow, Applicants respectfully request withdrawal of all rejections upon reconsideration.

The Present Invention

The present invention relates to a catalyst support used in selective gas phase reactions in a tubular reactor, comprising a metallic monolith having channels adapted to receive a catalytically active phase or an intermediate layer acting as a carrier for the catalytically active phase.

Claim Objections

Claims 7 through 34 were objected to under 37 CFR §1.75(c) as allegedly being in improper multiple dependent form. (Office Action at page 2.) Claims 3, 4, 6, 7, 9, 11, 13, 15, 17-20, 22-24, 29, and 31 have been amended to eliminate multiple dependence. Accordingly, Applicants respectfully request withdrawal of the claim objections and examination of the amended claims.

Rejections Under 35 USC §102(b)

Claims 1 through 3 and 6 have been rejected under §102(b) as being allegedly anticipated by Hershkowitz et al. (US Pat. No. 5,883,138). (Office Action at page 2.) The Office Action states that “Hershkowitz et al. discloses a metallic monolith catalyst in which the fluid flow is parallel to the catalyst axis. The catalytically active metal may be in a variety of forms, one being a monolith. Figure 3 demonstrates the irregular shape of the cell perimeter.” (Id.) Applicants respectfully traverse this rejection.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of Calif.*, 814 F.2d 628, 631 (Fed. Cir. 1987); MPEP §2131. The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989); MPEP §2131. Based upon these guidelines, Hershkowitz does not anticipate claims 1-3 and 6 of the present application.

As set forth in claim 1, the present invention comprises a metallic monolith catalyst support for *selective gas phase reactions*. Hershkowitz, on the other hand, describes in large part a premixing apparatus that premixes reagents at high velocities before injecting them into a reaction zone containing a catalyst retained in a fixed arrangement.¹ According to Hershkowitz, it is this premixing at high velocity, along with a relatively high pressure drop through the mixer, that forces the reaction to favor a desired stoichiometry once injected into the reaction zone. (Hershkowitz at col. 5, lines 1-5.) Hershkowitz does not disclose or

¹ Very little of the disclosure of Hershkowitz is directed to describing the structure and use of this reaction zone. The vast majority of the disclosure of Hershkowitz is directed to discussion of the structure and operation of the premixer/injector apparatus claimed therein.

suggest that the characteristics of a monolithic catalyst support structure affect the selectivity of the reactions described therein. In contrast, it is the structure of the monolith support itself in the present invention which affects selectivity of the gas phase reactions that take place within the structure. Because the metallic monolith is at the same time the support for catalytically active material and the medium for efficiently removing the heat of reaction (thus minimizing hot spots), catalyst deactivation is prevented or slowed thereby increasing selectivity of reactions. (See specification as originally filed at, *inter alia*, page 4, lines 6-9 and page 6, lines 27-30.)

Because Hershkowitz does not describe or suggest a monolith support structure suitable for performing *selective* gas phase reactions, an element of pending claim 1 (and therefore also an element of dependent claims 2, 3, and 6), Hershkowitz does not anticipate the claimed invention. Accordingly, Applicants respectfully request withdrawal of the claim rejections based on §102(b).

Rejections Under 35 USC §103(a)

Claims 4 and 5 have been rejected under §103(a) as allegedly being rendered obvious by Hershkowitz in view of Matros (US Pat. No. 6,314,722). The Office Action alleges that “Hershkowitz et al. demonstrates the irregular shape of the cell perimeter, but not regular shapes such as square, triangular, hexagonal, or circular. Matros et al. discloses a monolith catalyst, which has a square, circular, cylinder, or ring shape.” (Office Action at page 3.) The Office Action further asserts that “it would have been obvious to one of ordinary skill in the art at the time of the invention to use different cell shapes, as taught by Matros et al. in the Hershkowitz et al. monolith catalytic system because different cell shapes allow the flow conditions and hence reaction kinetics to be tailored to the required process.” (Id.) Applicants respectfully traverse this rejection.

To establish a *prima facie* case of obviousness, three basic criteria must be met:

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

MPEP §2142. Claims 4 and 5 of the present invention are not rendered obvious by the cited references because there is no suggestion or motivation to combine the cited references. Claims 4 and 5 define the shape of cells formed within a monolith catalyst support. The Office Action cites Figure 3 of Hershkowitz to support the assertion that the reference demonstrates an irregular-shaped cell perimeter. Figure 3, however, “is a plan view of the face and certain channels beneath the face surface of a multi-nozzle injector as illustrated in Fig. 1.” (Hershkowitz at col. 8, lines 65-67.) Therefore, Figure 3 depicts the injector described by Hershkowitz that is used for premixing reactants before injection into a monolithic catalyst structure. It does *not* depict the shape of cells within a monolithic catalyst support itself. Not only does Hershkowitz fail to depict the shape of cells within a monolithic catalyst support, it also fails to disclose cells within a monolith support altogether, regardless of their shape. As such, there is no motivation or suggestion for one of skill in the art to seek to combine Hershkowitz with a reference describing regularly-shaped cells within a monolithic structure.

Similarly, as discussed previously, Hershkowitz teaches the use of a premixer/injector to achieve the desired reaction conditions and mechanism once inside the reaction zone. The disclosure of Hershkowitz does not suggest that selectivity of gas phase reactions is affected by the structure of a monolithic catalyst support, nor does it suggest that the inclusion of cells within a monolith will affect reaction kinetics. As such, there is no motivation to look to Matros, or any other reference, to seek different cell shapes to “allow the flow conditions and hence reaction kinetics to be tailored to the required process.” (Office Action at page 3.)

The Office Action has failed to provide any motivation to combine and/or modify the cited references so as to render the present claims obvious and, therefore, has failed to satisfy all three criteria required for a *prima facie* case of obviousness. *In re Rouffet*, 47 USPQ2d 1453, 1457-8 (Fed. Cir. 1998) (“To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.”) Therefore, Applicants respectfully request reconsideration and withdrawal of the claim rejections under §103(a).

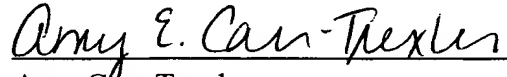
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Conclusion

In light of the foregoing amendments and remarks, Applicants respectfully request withdrawal of all claim objections and rejections and allowance of the pending claims. Applicants invite the examiner to contact the undersigned at (215) 557-5966 to clarify any issues not resolved by this response.

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